BOARD OF COUNTY COMMISSIONERS
AGENDA ITEM SUMMARY

Meeting Date: March 16, 2005 Division: Engineering

Bulk Item: Yes ___ No X Department: Engineering

Staff Contact Person: David S. Koppel, PE
County Engineer

AGENDA ITEM WORDING: Approval to recommend to FDOT Alternative 1 for the Card Sound Road/C905 Intersection.

ITEM BACKGROUND: Improvements to this intersection are needed to facilitate traffic movement during emergency and normal traffic conditions. FDOT has proposed four alternatives. Alternate 1 (recommended by County Staff) creates a new T-intersection with a free flow condition along the new curve. Alternative 2 (recommended by FDOT staff) maintains the existing intersection and adds a new curve. FDOT is recommending this because of its lower cost and lesser environmental impact. County staff is opposed to this alternative because it is confusing and potentially dangerous. Alternative 3 is the same as Alternative 2 except that the new curve would be built on a structure. Alternative 4 is virtually what we have today except for minor improvements. All alternatives, except for Alternative 4, will have a design speed of 30 mph.

PREVIOUS RELEVANT BOCC ACTION: The BOCC has urged FDOT to expedite improvements to the intersection.

CONTRACT/AGREEMENT CHANGES: None

STAFF RECOMMENDATIONS: Approval as stated above. Monroe County will advance the money to FDOT to expedite the project and accept reimbursement from FDOT at a later time.

TOTAL COST: _____ **BUDGETED:** Yes ___ No ___

COST TO COUNTY: _____ **SOURCE OF FUNDS:** _____

REVENUE PRODUCING: Yes ___ No ___ **AMOUNT PER MONTH** ____ **Year** ____

APPROVED BY: County Atty ___ OMB/Purchasing ___ Risk Management ____

DIVISION DIRECTOR APPROVAL: _____
David S. Koppel, PE, County Engineer

DOCUMENTATION: Included X Not Required ____

DISPOSITION: _____ **AGENDA ITEM #** _____

Revised 2/05

DAGNY JOHNSON KEY LARGO HAMMOCK BOTANICAL STATE PARK

DAGNY JOHNSON KEY LARGO HAMMOCK BOTANICAL STATE PARK

200' 125' 125' 100'

EXISTING OVERHEAD TELEPHONE

EXISTING TRANSMISSION LINE POLE (TYP.)

EXISTING R/W

100'

CR-905

EXISTING OVERHEAD ELECTRIC

0 20 100 Feet

495

490

150'

EXISTING R/W

120' 120'

EXISTING R/W

DS= 30 MPH

WETLAND AREA

CROCODILE LAKE NATIONAL WILDLIFE REFUGE

572

EXISTING R/W

CONSTRUCTION LINE

CROCODILE LAKE NATIONAL WILDLIFE REFUGE

WETLAND AREA

EXISTING OVERHEAD ELECTRIC

42'

EXISTING CULVERT

150'

520'

CARD SOUND RD (CR 905A)

R/W LINE

℄ CONSTRUCTION

R/W LINE

75' ± 48' ±

8' SHLDR.	17' MERGE RAMP	15' LANE	15' TURN LANE	15' LANE	8' SHLDR.
4"	4"			4"	4"
0.06	0.05	0.05	0.05	0.05	0.06

TYPICAL SECTION A-A

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CARD SOUND ROAD (CR-905 A) AND CR-905
INTERSECTION CONVERSION PD & E STUDY

URS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR-905 A	MONROE	

ALTERNATIVE 1

SHEET NO. 1


DAGNY JOHNSON KEY LARGO HAMMOCK BOTANICAL STATE PARK
DAGNY JOHNSON KEY LARGO HAMMOCK BOTANICAL STATE PARK
EXISTING OVERHEAD TELEPHONE
EXISTING TRANSMISSION LINE POLE (TYP.)
EXISTING R/W
CR 905
EXISTING OVERHEAD ELECTRIC
0 20 100
Feet
500
495
490
150'
HARDWOOD HAMMOCK
STOP
120'
120'
320'
EXISTING R/W
EXISTING R/W
R=288'
DS= 30 MPH
PROPOSED CULVERT
A
A
WETLAND AREA
275
STOP
CROCODILE LAKE NATIONAL WILDLIFE REFUGE
EXISTING R/W
STEEL SHEET PILING
CONSTRUCTION LINE
CROCODILE LAKE NATIONAL WILDLIFE REFUGE
WETLAND AREA
EXISTING OVERHEAD ELECTRIC
STOP
EXISTING CULVERT
CARD SOUND RD (CR 905A)
STOP AHEAD
270
75'
6' SHLDR.
12' LANE
12' LANE
6' SHLDR.
4"
4"
4"
4"
0.06
0.05
0.05
0.06
STEEL SHEET PILING
TYPICAL SECTION A-A

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CARD SOUND ROAD (CR-905 A) AND CR-905
INTERSECTION CONVERSION PD & E STUDY

URS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR-905 A	MONROE	

ALTERNATIVE 2

SHEET NO. 2

DAGNY JOHNSON KEY LARGO HAMMOCK BOTANICAL STATE PARK

DAGNY JOHNSON KEY LARGO HAMMOCK BOTANICAL STATE PARK

EXISTING OVERHEAD TELEPHONE

EXISTING TRANSMISSION LINE POLE (TYP.)

EXISTING R/W

CR 905

EXISTING OVERHEAD ELECTRIC

0 20 40 80 Feet

500

495

490

150'

EXISTING R/W

HARDWOOD HAMMOCK

120'

120'

320'

EXISTING R/W

R=288'
DS= 30 MPH

WETLAND AREA

CROCODILE LAKE NATIONAL WILDLIFE REFUGE

EXISTING R/W

EXISTING OVERHEAD ELECTRIC

EXISTING CULVERT

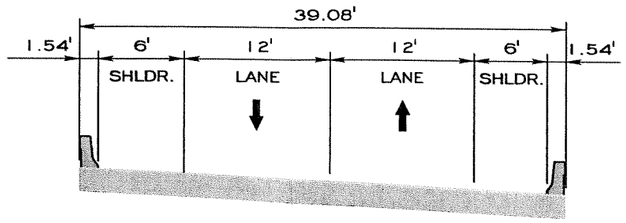
CARD SOUND RD (CR 905A)

N20°E

75'

CROCODILE LAKE NATIONAL WILDLIFE REFUGE

WETLAND AREA



TYPICAL SECTION A-A
STRUCTURE

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CARD SOUND ROAD (CR-905 A) AND CR-905
INTERSECTION CONVERSION PD & E STUDY

URS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR-905 A	MONROE	

ALTERNATIVE 3

SHEET NO. 3

DAGNY JOHNSON KEY LARGO
HAMMOCK BOTANICAL STATE PARK

EXISTING
OVERHEAD
TELEPHONE

EXISTING
TRANSMISSION
LINE POLE (TYP.)

EXISTING R/W

CR 905

EXISTING
OVERHEAD
ELECTRIC

500

150

EXISTING R/W

R=50

HARDWOOD
HAMMOCK

DS= 15 MPH

EXISTING R/W

WETLAND AREA

CROCODILE LAKE
NATIONAL WILDLIFE REFUGE

EXISTING R/W

EXISTING
OVERHEAD
ELECTRIC

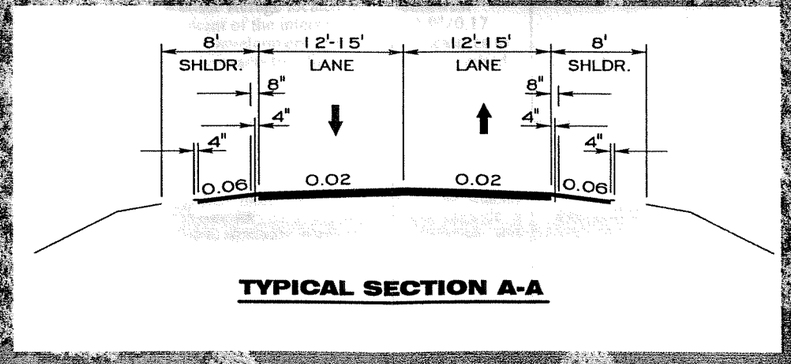
EXISTING
CULVERT

CARD SOUND RD (CR 905)

270

75'

* SIGN TO BE COVERED DURING EMERGENCY EVACUATION EVENTS TO ALLOW FREE FLOW OF TRAFFIC IN THE NORTHBOUND TO WESTBOUND DIRECTION (TOWARD MIAMI-DADE COUNTY)



TYPICAL SECTION A-A

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CARD SOUND ROAD (CR-905 A) AND CR-905
INTERSECTION CONVERSION PD & E STUDY

URS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR-905 A	MONROE	

ALTERNATIVE 4

SHEET NO.
4

TABLE 1
CARD SOUND ROAD AND CR-905 INTERSECTION IMPROVEMENT EVALUATION MATRIX

	CRITERIA	NO PROJECT	ALT 1 T-intersection *Plan Sheet No. 1*	ALT 2 – Curve (Fill) (Preferred) Two lanes, Two-way *Plan Sheet No. 2*	ALT 3 – Curve (Structure) Two lanes, Two-way *Plan Sheet No. 3*	ALT 4 -TSM R=60' *Plan Sheet No. 4*
DESCRIPTION	**Geometry and Operation**	Existing lane configuration and operation remain the same.	New intersection configuration. Southbound approach: one left turn lane and one right turn lane. Eastbound approach: one left turn lane and one thru lane. Northbound approach: one thru lane and one right turn lane.	Existing intersection remains the same. New eastbound to southbound at-grade two-lane curve ramp allows free flow of traffic in both the northbound and southbound directions along the curve.	Existing intersection remains the same. New eastbound to southbound grade-separated two-lane curve ramp allows free flow of traffic in both the northbound and southbound directions along the curve.	Minor modifications to existing intersection geometry. Increasing existing curve radius from 50' to 60' and widening receiving lanes to 15', tapering down to 12'.
COST	**Construction Cost**	$0.00	$1,750,000	$1,140,000	$1,905,000	$139,000
ENVIRONMENT	**R/W Impacts**	No Impacts	Right of way impacts to natural habitat. Right of way acquisition required.	Right of way impacts to natural habitat – but less than Alternative 1. Right of way acquisition required.	Right of way impacts to natural habitat (same as Alternative 2. Right of way acquisition required.	No Impacts
	Environmental Considerations (4f and refuge)	No Impacts	Impact to the Crocodile Lake National Wildlife Refuge located in the southwest quadrant of the intersection (19,400 ft^2 / 0.44 acre). Development of mitigation measures to offset impacts to refuge properties is required.	Impact to the Crocodile Lake National Wildlife Refuge located in the southwest quadrant of the intersection (7,500 ft^2 / 0.17 acre). Development of mitigation measures to offset impacts to refuge properties is required.	Impact to the Crocodile Lake National Wildlife Refuge located in the southwest quadrant of the intersection (7,500 ft^2 / 0.17 acre). Development of mitigation measures to offset impacts to refuge properties is required.	No Impacts
	Wetland Impacts	No Impacts	(48,900 ft^2 / 1.12 acre)	(18,100 ft^2 / 0.42 acre)	(18,100 ft^2 / 0.42 acre) The area under the bridge would be shaded (indirect impacts) but it will still provide a wildlife corridor between the hammock and the mangrove system as well as maintain habitat for fish and wildlife species.	No Impacts
	Other Habitat Impacts	No Impacts	Direct Impact to Hardwood Hammock Preserve and Woodrat Habitat in the southwest corner of the intersection. (0.2 acre)	Secondary impacts to Hardwood Hammock Preserve and Woodrat Habitat in the southwest corner of the intersection. A 60-inch culvert is proposed to provide hydrologic connection.	Temporary impacts to Hardwood Hammock Preserve and Woodrat Habitat in the southwest corner of the intersection. Maintains habitat connection.	No Impacts

TABLE 1
CARD SOUND ROAD AND CR-905 INTERSECTION IMPROVEMENT EVALUATION MATRIX

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ENGINEERING	Evacuation	No Improvements	Traffic operations during evacuation events remain the same as in regular operation conditions.	Traffic operations during evacuation events remain the same as in regular operation conditions.	Same as Alternative 2	Wider curve radius and receiving lanes facilitate traffic flow. Emergency management personnel required. Existing stops sign at southeast corner to be covered during emergency evacuation events to allow free flow of traffic in the northwestbound direction (toward Miami-Dade County).
	Traffic Operations	Normal Operation No congestion	Normal Operation No congestion	Normal Operation No congestion. Adding 3 stop signs	Same as Alternative 2	Normal Operation No congestion
		Emergency Early Response *(NB approach STOP Control)* -ICU: 160% -Turning Speed: 9 mph -Vehicle through intersection: 982 vph	Emergency Early Response -ICU: 124% -Turning Speed: 18 mph -Vehicle through intersection: 1787 vph	Emergency Early Response -ICU: 118% -Turning Speed: 22 mph -Vehicle through intersection: 1880 vph	Same as Alternative 2	Emergency Early Response -ICU: 140% -Turning Speed: 14 mph -Vehicle through intersection: 1816 vph
		Emergency Normal Response *(NB approach STOP Control)* -ICU: 125% -Turning Speed: 10 mph -Vehicle through intersection: 987 vph	Emergency Normal Response -ICU: 102% -Turning Speed: 21 mph -Vehicle through intersection: 1623 vph	Emergency Normal Response -ICU: 95% -Turning Speed: 24 mph -Vehicle through intersection: 1574 vph	Same as Alternative 2	Emergency Normal Response -ICU: 108% -Turning Speed: 15 mph -Vehicle through intersection: 1562 vph
		Emergency Late Response *(NB approach STOP Control)* -ICU: 85% -Turning Speed: 10 mph -Vehicle through intersection: 1001 vph.	Emergency Late Response -ICU: 71% -Turning Speed: 23 mph -Vehicle through intersection: 1058 vph.	Emergency Late Response -ICU: 64% -Turning Speed: 25 mph -Vehicle through intersection: 1070 vph.	Same as Alternative 2	Emergency Late Response -ICU: 75% -Turning Speed: 16 mph -Vehicle through intersection: 1049 vph.
	Drainage	No change	Additional Impervious area requires drainage treatment. French Drain structures are provided.	Additional Impervious area requires drainage treatment. French Drain structures are provided.	Additional Impervious area requires drainage treatment. French Drain structures are provided.	No change
	Utility Impacts	No Impacts	Two transmission line poles relocation required.	Two transmission line poles relocation required.	Two transmission line poles relocation required.	No Impacts

TABLE 2

CARD SOUND ROAD AND CR-905 INTERSECTION IMPROVEMENT
PROJECT OBJECTIVES MATRIX

	ALTERNATIVES	NO PROJECT	ALT 1 T-intersection *Plan Sheet No. 1*	ALT 2 – Curve (Fill) (Preferred) Two lanes, Two-way *Plan Sheet No. 2*	ALT 3 – Curve (Structure) Two lanes, Two-way *Plan Sheet No. 3*	ALT 4 -TSM R=60' *Plan Sheet No. 4*
PROJECT OBJECTIVES	Maximize travel speed/capacity of intersection during evacuation events and/or detours when US 1 (18-mile stretch) is closed	-	✓	✓	✓	-
	Same operation during both regular conditions and evacuation events to establish driver familiarity with intersection	✓	✓	✓	✓	-
	Emergency Management Personnel not required during evacuation events	-	✓	✓	✓	-
	Improve Daily Traffic Operations	-	✓	-	-	✓
	Avoid Environmental and Section 4(f) Impacts	✓	-	-	-	✓
	Minimize Environmental and Section 4(f) impacts while meeting maximum number of project objectives	-	-	✓	✓	-

✓ **Meets Project Objective**

\- **Does not meet Project Objective**